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# The Western Scholar

Editors

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*The Western*

# SCHOLAR

THE SPIRIT OF SCHOLARSHIP AND RESEARCH AT WESTERN KENTUCKY UNIVERSITY



In the Western Kentucky University Strategic Plan, Challenging the Spirit, the following statement is included as part of the University's Mission Parameters: "The University places a premium on teaching and learning. Its faculty engage in creative activity and diverse scholarship, including basic and applied research, designed to expand knowledge, improve instruction, and to provide optimum service to the state and nation."

The current edition of *The Western Scholar* again provides evidence that the faculty of the University continue to make the above statement a reality. In the stories to follow we see the impact that lively and inquiring minds can have on a wide array of subject areas. And virtually without exception, the connections between the scholarship of faculty members and the enrichment of the teaching/learning process for students are clear. That impact may come directly through involvement of students in these faculty research projects or more indirectly through the enrichment, enthusiasm, and role modeling that these faculty members bring to the classroom.

Sharon Mutter is on the faculty in the Department of Psychology. In the work reported here, Dr. Mutter is engaged in basic research on the effects of aging on human cognitive processes. She has been conducting experimental research to seek a better understanding of our ability to learn from positive and negative contingencies in our environment as we age. As our population ages and a larger percentage of us fall into the older age categories, it will become even more important to understand how learning and memory processes change over the individual's life cycle. Dr. Mutter's work on this project is supported by a generous grant from the National Institute on Aging.

Field research in a distant part of the world is the venue for some fascinating work being done by Dr. Jeffrey Samuels of the Department of Philosophy and Religion. Dr. Samuels is interested in gaining a better understanding of the process through which boys and young men decide to make the lifetime commitment of becoming a Buddhist monk. He is conducting his research in the South Asian country of Sri Lanka where he has visited several times to observe, do interviews, and collect other data. So far, he has discovered the important role played by aesthetics in these life-transforming decisions. The connection between his research and his teaching of courses on Asian religions is clear.

The research of Dr. Kunlei Liu from the Department of Architectural and Manufacturing Sciences falls very much in the applied category. He has a long-standing interest in the study of coal and has been focusing recently on finding ways to reduce the emissions of mercury and other pollutants when coal is burned. Since Kentucky is a major coal-producing state and since the marketability of coal depends, in part, on improved methods of reducing unwanted pollution when coal is burned, Dr. Liu's research is of great interest to both industry and government in the state and nation. His applied research is a good example of the partnerships that can be formed between industry and the university to solve real-world problems.

Anthony Harkins is a relatively new faculty member in the Department of History, but he is already beginning to make an impression with his interesting research on the concept and history

of the "hillbilly" in American culture. Oxford University Press recently published his book on this subject. Dr. Harkins' work, which falls at the intersection of traditional history and cultural anthropology, seeks to explain the origin and evolution of the hillbilly concept through its treatment in books, articles, cartoons, television, movies, and music. His efforts will undoubtedly enrich his teaching and will contribute to our understanding of how cultural icons of this type emerge in our society.

Western mathematician Dr. Bruce Kessler is engaged in basic research linking mathematic-numeric processes to the filtering and compressing of images. In other words, he works with learning ways in which images can be stored, manipulated and compressed through the use of the tools of mathematics, specifically through the application of fractal functions. Although this research appears to be quite

abstract, it has the potential for many applications both in industry and related science fields. Dr. Kessler has received grants from the National Science Foundation and the Kentucky Science and Engineering Foundation and makes it a priority to include undergraduate students in his research.

Dr. Laura McGee from the Department of Modern Languages and Intercultural Studies took advantage of a Fulbright award to advance her research on the role of film and filmmakers in Germany. Her specific objective with this project is to study the lives and work of the last generation of East German filmmakers who worked before

and then after the fall of the "wall" and the reunification of the German nation. She selected twelve representatives of this generation and has carefully studied their films, conducted library research on them at the Academy for Film and Television, and personally interviewed many of them. Her study, which has already resulted in publications, represents a significant look at the intersections of art, politics, and culture.

The impact of idealized female body images on young girls and female adolescents has been widely noted and studied. Much less studied is the impact of idealized male body images on young boys and male adolescents. Dr. Rick Grieve of the Department of Psychology is working on research focused on the latter group to help build our knowledge base in that area. One finding is that "muscle dysmorphia," a condition that can develop when males become preoccupied with muscular body shape, can cause physical impairment and distress.

Dr. Johnny Chan is the new holder of the Leon and Ruby Mai Page Chair in Finance. He came to Western as a prolific author in the fields of finance and finance education and has added significantly to his research output since his arrival here in 2003. Dr. Chan is an excellent example of the teacher/scholar who is able to bridge the often-perceived gap between effective classroom teaching and active research. He is particularly interested in research on the role derivatives play in the field of finance and he continues to work on testing effective pedagogies for teaching/learning in finance education.

I am sure that you will find the articles in this edition of *The Western Scholar* interesting and informing. I commend them to your attention.

John H. Petersen

Associate Vice President for Academic Affairs





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# The Western SCHOLAR

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Photograph by Sheryl Hagan-Booth





Photo Collage by April Petty

# Age Effects

## IN LEARNING AND JUDGEMENT

BY BOB SKIPPER

**AS WE AGE, OUR ABILITY TO MAKE JUDGMENTS ABOUT THE RELATIONSHIPS BETWEEN EVENTS IN OUR ENVIRONMENT CHANGES. FOR EXAMPLE, WE MIGHT FIND IT HARDER TO ASSOCIATE CERTAIN MEDICATIONS WITH THEIR SIDE EFFECTS. WE MIGHT FIND IT MORE DIFFICULT TO PERCEIVE ASSOCIATIONS BETWEEN EVENTS, WHICH MAY NEGATIVELY AFFECT OUR JUDGMENTS. WHILE OUR WANING ABILITY TO MAKE JUDGMENTS MAY BE A NATURAL EFFECT OF AGING, DR. SHARON MUTTER WANTS TO FIND OUT WHY THESE CHANGES HAPPEN.**

Using a five-year, \$750,000 grant from the National Institute on Aging, Dr. Mutter is looking at the effect age has on basic cognitive processes, such as working memory performance. Working memory is a system for temporarily storing and manipulating information. Dr. Mutter studies how changes in these cognitive processes affect a person's ability to make contingency judgments.

"The goal of my research is to take a closer look at a fundamental kind of judgment that we all make called a contingency judgment," the Western Kentucky University psychology professor said. "A contingency judgment involves detecting and providing a numerical estimate of the relationship between two events. These kinds of judgments underlie important behaviors such as causal reasoning and hypothesis testing.

"When you interact with your environment, you're exposed to certain events, and over a period of time you learn the relationships between these events. Once you've learned these relationships, then you are able to make predictions and judgments. For example, most people have learned that the presence of dark clouds often predicts rain."

Dr. Mutter, who has a doctorate in experimental psychology from George Washington University, said her research has shown that older adults are not as good at learning contingencies between events and using this information to make judgments and predictions.

"We've done several studies looking at older adults' ability to learn contingencies in the environment and have

discovered that they don't seem to be as proficient at it," she explained. One consistent finding is that older adults have more problems with negative contingency judgments than positive contingency adjustments. Negative contin-



Dr. Sharon Mutter

*"The goal of my research is to take a closer look at a fundamental kind of judgment that we all make called a contingency judgment."*

gencies "require that you notice the absence of information and that seems to be a more difficult thing for older adults to do, so we're trying to figure out why," she said.

"The heart of what we're trying to do right now is figure out why older adults show these changes in their contingency judgments," Dr. Mutter added. "After all, older adults were young once, young adults seem to be doing reasonably well making contingency judgments, so what happens with age that makes this particular kind of learning poorer? These are not huge changes in older adults' performance and they're not changes that make them unable to function. But we are able to measure these changes in the laboratory and now we want to try to understand why they occur."

Some of the cognitive processes being investigated include working memory, especially the ability to do multiple tasks simultaneously, and the ability to learn and remember simple associations between events. These



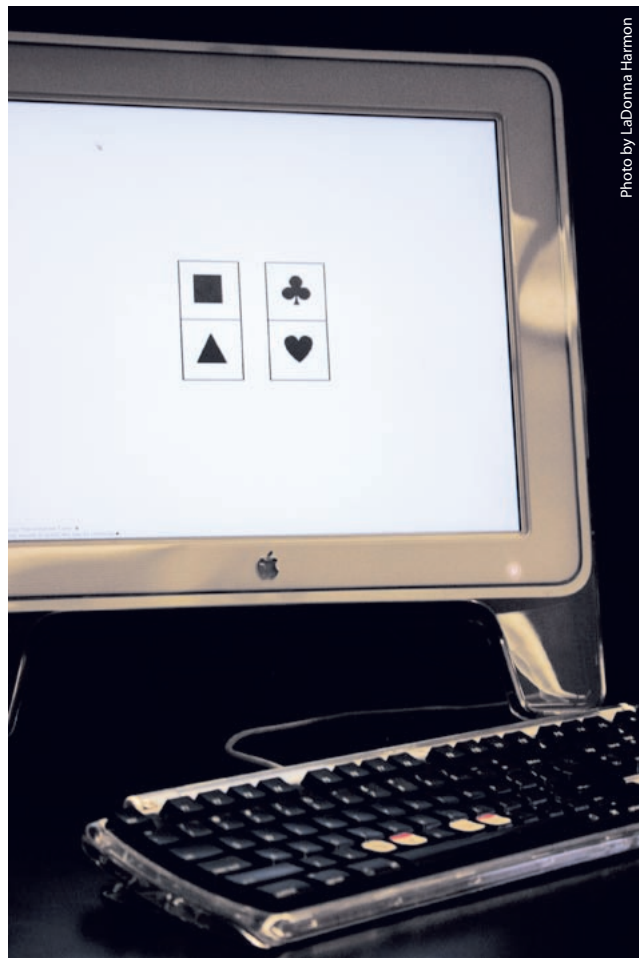


Photo by LaDonna Harmon

One trial of a test Dr. Mutter administers to determine whether people can learn to predict an outcome on the basis of the presence or absence of an undisclosed feature.

investigations are taking place in a series of studies, including two being run by graduate students for their master's theses, and a large-scale correlational study.

In the large-scale study, older and younger adults are given a medical diagnosis task involving a fictional disease. They are given information about patient cases, each with its particular symptoms or lack of symptoms. "They see the symptom and then they're asked to predict whether or not the patient has the disease," she said. The participants are then given feedback as to whether the disease was or was not present.

"So participants are given a series of cases where they are supposed to learn, just like a student in medical school, whether there is a relationship between the symptom and the disease," Dr. Mutter said. "After they have seen all of the cases for a problem, then they have to make a

***"The heart of what we're trying to do right now is figure out why older adults show these changes in their contingency judgments," Dr. Mutter added. "After all, older adults were young once, young adults seem to be doing reasonably well making contingency judgments, so what happens with age that makes this particular kind of learning poorer?"***

contingency estimate (or guess at a patient's outcome)," by expressing a numerical estimate from negative 100 (when the symptom is present, the disease will be absent) to positive 100 (when the symptom is present, the disease will be present).

In addition, Dr. Mutter is giving the participants tests that measure a variety of cognitive functions, including reaction time, working memory, associative learning and memory, vocabulary, and comprehension.

"We want to get a really good picture of young and older adults' functioning in a variety of cognitive areas so that we can see which of those areas mediate the age-related decline in contingency judgment," she said. "It's really a question of what goes into these judgments. Is it reaction time? Is it working memory? Is it general knowledge? What sorts of processes help us learn the contingencies in our environment in a really effective way and are changes in these processes responsible for older adults' difficulties with contingency judgment?"

An investigation of the role of basic cognitive processes in contingency judgment is also the focus of other experiments being conducted in Dr. Mutter's laboratory. In one experiment, young adults' working memory resources are reduced by preloading this memory system with other information to see what effect this has on their contingency learning. "If working memory decline is the source of age differences in contingency judgment, and we reduce young adults' working memory resources while they are learning a contingency, then their judgments ought to look more like older adults' judgments," Dr. Mutter said.

"What we have discovered is that it does seem to be the case that certain aspects of working memory are related to contingency judgment. But other things seem to be important as well. For example, associative memory — that is your ability to remember associations that you've formed

— is also really important. And age-related changes in these cognitive processes don't completely explain the age differences in contingency judgment. There's something else going on and we don't know what that is yet."

While Dr. Mutter said her studies are basic research, there are some practical implications to her work. "I don't

know that we can help older adults completely regain the ability to learn contingency information, because I think it is pretty much a fundamental cognitive change, but what we might be able to do is provide them with an awareness that this change does occur, so that they can be more cautious about their judgments."



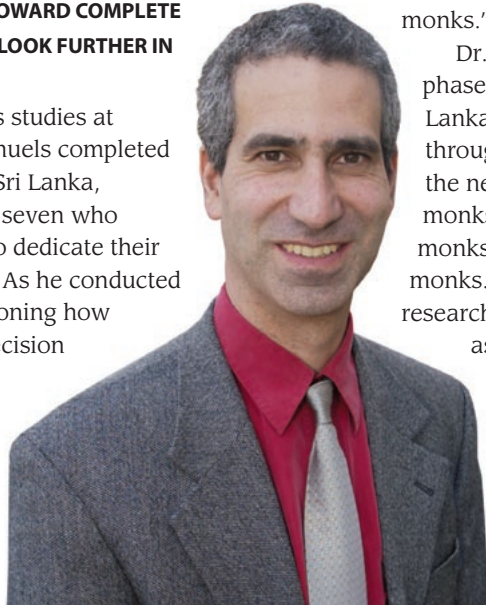
***"When you interact with your environment, you're exposed to certain events, and over a period of time you learn the relationships between these events."***





**JEFFREY SAMUELS HAS SPENT A GOOD PORTION OF HIS CAREER STUDYING THE SPIRITUAL TRANSFORMATION OF BUDDHIST MONKS AS THEY COMMIT THEMSELVES FULLY TO MONASTIC LIFE. THERE IS SOMETHING ALMOST HYPNOTIZING ABOUT THE CASUAL OBSERVER'S REACTION TO THE BEAUTIFUL RITUALS AND SOLEMN STEADFASTNESS OF THEIR LIFESTYLE. MOST BUDDHIST MONKS ENTER THE MONASTERY AS CHILDREN, BUT WHAT CAUSES THEM TO MAKE THIS DECISION TOWARD COMPLETE DEDICATION? DR. SAMUELS DECIDED TO LOOK FURTHER IN SEARCH OF THE ANSWER.**

An assistant professor of religious studies at Western Kentucky University, Dr. Samuels completed his doctoral dissertation research in Sri Lanka, where he observed boys as young as seven who had made the lifetime commitment to dedicate their career to becoming Buddhist monks. As he conducted his research, he found himself questioning how such young children could make a decision that would require such intellectual capacity and mature understanding. This became the topic of his most recent research, *Children in Robes: Aesthetics, Ritual, and Language*, which has been funded through the Metanexus Institute's Spiritual Transformation Project.



Dr. Jeffrey Samuels

"My initial research has shown there is a real aesthetic dimension to monastic life that children find attractive. For example, a child in our country might see a shiny red fire truck and decide he wants to become a fireman. Likewise, children there see the respect that is shown toward monks and are intrigued by their shaven heads, the mannerisms in which they walk and talk, and their beautiful robes. I found that this influenced children's decisions to become monks."

Dr. Samuels is currently in the middle phase of his research. He spent time in Sri Lanka in the summer of 2003, and his grant through the Metanexus Institute runs through the next two years. He has interviewed head monks, young men in training to become monks, lay devotees, and parents of young monks. One method Dr. Samuels used in his research involved giving children cameras and asking them to take pictures of their lives. He then interviewed the children about their pictures, with each picture sometimes taking as much as forty-five minutes to describe.

"It is fascinating because these children go back and forth between being boys and being monks. At times they might be having fun

***It is fascinating because these children go back and forth between being boys and being monks. At times they might be having fun playing marbles and cricket, but at other times, when they are observed in their ritual context, they are very much monks.***

"As I visited with many of these very young monks, I found that most of them see their decision to enter the monastery as their own decision. I wanted to know why they chose to become monks in the first place," he said.

"In 1999 I went to Sri Lanka with a plan of doing something entirely different with my research," Dr. Samuels continued. "I went to the temple and found many young kids living there. My previous opinion had been that men become monks to overcome suffering. As I saw the children playing and being boys, I realized that it was not simply a textbook phenomenon."

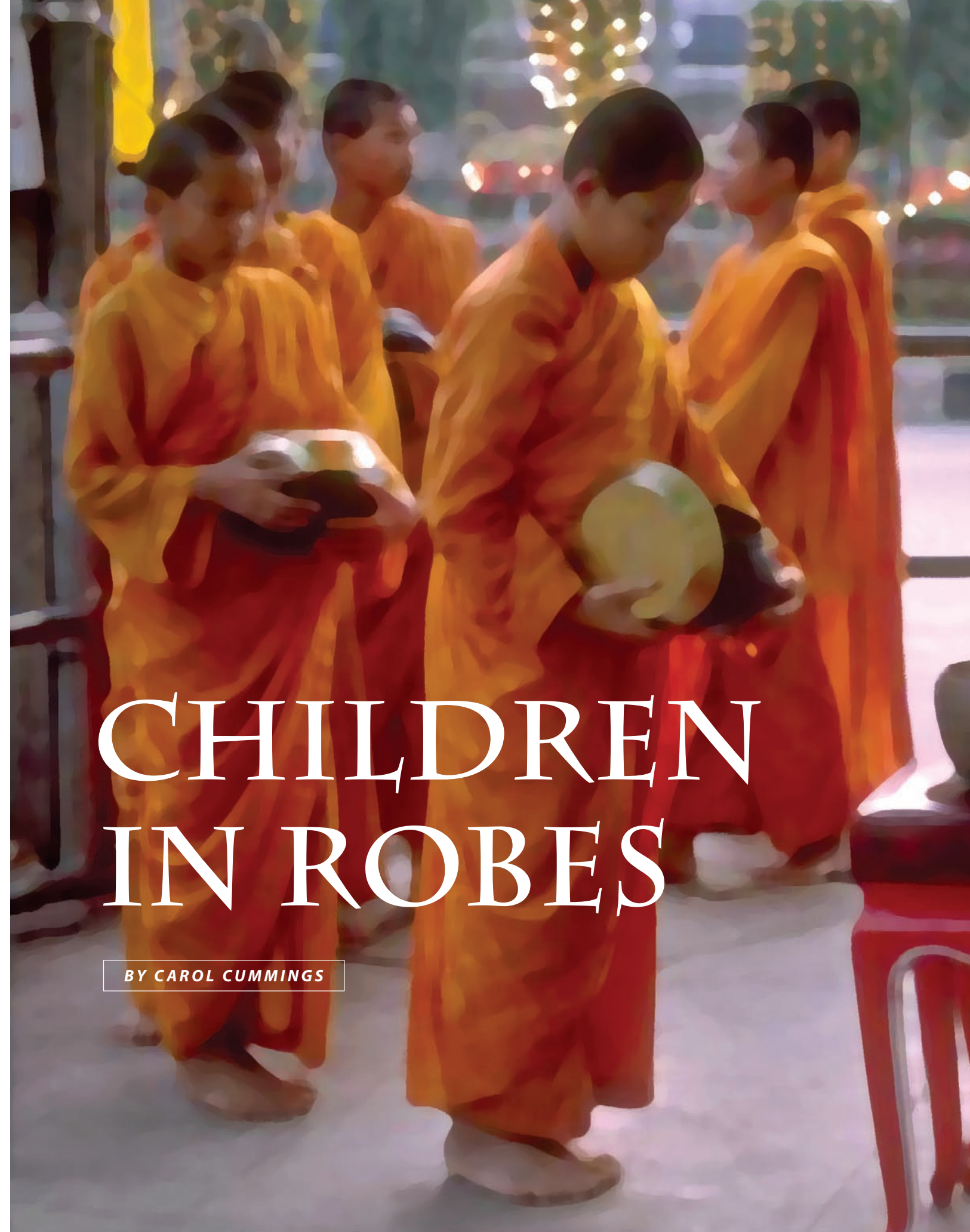
Dr. Samuels said that most research into spiritual transformation and religious conversion assumes the individual undergoing transformation is someone with mature cognitive abilities. How does this differ when the committed individual is a mere child?

"I knew that something else must be happening, so I wanted to figure out what was going on," Dr. Samuels said.

playing marbles and cricket, but at other times, when they are observed in their ritual context, they are very much monks," he said.

According to Dr. Samuels, becoming a monk is a two-step process. The first occurs as early as age seven or eight when boys first enter the monastery, and the second occurs at age twenty when they make their final lifetime commitment. "It is a gradual training process," he said. "From society's view, if a boy chooses to leave before the second stage, it is not that big a deal. It is a gradual process of socialization, allowing him to see and understand his role as a lifetime vocation."

Young boys in the monastery go to monastic schools where they are taught religion, languages (Sanskrit, Pali, and English), history, geography, and math. "Buddhist scholars have often argued that monastic disciplinary texts and/or handbooks are important in educating and training Buddhist monks," Dr. Samuels believes. "While the



# CHILDREN IN ROBES

BY CAROL CUMMINGS





Photo by Jeffrey Samuels

texts highlighted by many scholars undoubtedly convey to the reader ideal images of monastic behavior and deportment, the actual role of texts in shaping the identities and goals of young monastics may be questioned.”

Dr. Samuels’ new research builds on his previous study on the training and socialization of children monastics in Sri Lanka. Funded through a Fulbright Fellowship between the years of 1998 and 2000, his earlier research explored the effects that monastic life had on the short- and long-term goals of thirty-eight novice monks, as well as the role that relationships played in shaping their identities and their ideas of monastic service. While it may be true that some who enter the monastery to devote themselves to Buddhism might do so out of a direct experience of suffering, Dr. Samuels said many

of the children decided to become monks as a result of other factors.

In fact, of Dr. Samuels’ original thirty-eight subjects, the majority pointed out that their decision to become monks was the direct result of “witnessing monks performing rituals, observing the lives of other monks in Buddhist temples, hearing monks chat, seeing monks walk and speak in a prescribed manner, watching other boys become ordained, and so on.”

Dr. Samuels writes: “One such monk, when asked about the factors leading up to his decision to become a monastic, said, ‘At my village, I saw the ordination of two boys. They were dressed like princes and rode on elephants. Seeing them dressed so beautifully and all the glory surrounding the event, I decided to become a monk myself. I went home and asked my mother. She later

agreed.’” For that boy and others involved in Dr. Samuels’ study, the decision to become a monk was not the result of either intellectual understanding of religious doctrines or the result of experiencing suffering. It was the result of an “aesthetical experience of Buddhism.”

“More than seventy percent of the monks who were part of that study expressed how eating, speaking, drinking, walking, and wearing the monastic robe in an aesthetically prescribed manner were important in the process of ‘becoming monks,’” Dr. Samuels writes. “One monk remarked, ‘The head monk advised us not to run, that we should not eat like before, that we should not dance and whistle, and that we should play less. He taught us how to be disciplined. Listening to that and practicing it, I learned about being a monk.’”

Dr. Samuels said that by further investigating the role of aesthetics in these lifetime decisions to become monks, his project would greatly contribute to our understandings of spiritual transformation, especially among children. “Even though this project will focus on the Buddhist religion, the results of this study will enable scholars interested in spiritual transformation to look at the effects of aesthetics on people’s orientation toward the sacred in other religious traditions.”

Closely related to aesthetics is the role that performing rituals plays in shaping perspectives and commitment toward the sacred. “The function that performing rituals play in spiritual transformation is something that was initially revealed during my previous research project in Sri Lanka,” he said. “When speaking about their lives and goals as religious clergy and the processes by which they became subjectively transformed, many children monks mentioned the importance of performing rituals, such as honoring or worshipping the Buddha through various postures and chants, performing Buddhist protection rituals, and even sweeping the temple in a ritually prescribed manner.

He continued: “For them, becoming monks was not so much the result of reading inspiring accounts of the lives of famous Buddhist monks, or learning about religious doctrines so as to make sense of the world; rather, it was something that happened gradually

through involving themselves in everyday temple activities.”

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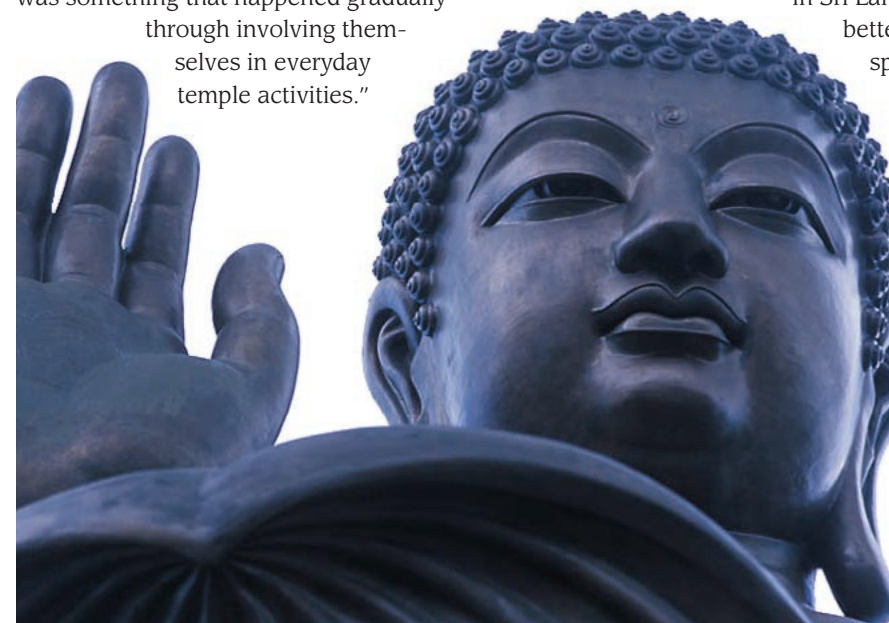
The third area Dr. Samuels will investigate relates to the role that language plays in spiritual transformation. “For many, the experience of religion is often intertwined with language,” he writes. “Attending a Jewish prayer service in Hebrew, hearing and reciting Gregorian chants, chanting Buddhist texts in Pali or Sanskrit play an undoubtedly important role in religious conversion and spiritual transformation. However studies on spiritual transformation have paid little attention to language and speech. This study will overcome this little-researched topic.

“While scholars studying the Buddhist tradition may believe that people who enter the monkhood for reasons unrelated to an experience of a crisis are often less committed to the religious life, the initial evidence surrounding the spiritual transformation of children monks in Sri Lanka belies their views,” he concluded. “This project will investigate the relationship that may or may not exist between initial motivating factors leading one to adopt the life of a Buddhist monk

and commitment to the sacred by addressing the following questions: Are males who become monks due to a profound crisis more committed to the religious life than those who have not experienced a crisis? What role does monastic life play in shaping and transforming a monk’s religious commitment?

“Asking these questions in the context of children monks in Sri Lanka will not only help scholars to arrive at better understandings of the factors prompting spiritual transformation, but also will help change scholars’ focus from factors prompting initial transformation to factors that deepen one’s perspectives and attitudes toward the sacred.”

Dr. Samuels completed his bachelor’s degree at the University of California at Berkeley, his master’s degrees at both the University of Colorado in Boulder and the University of Virginia, and his doctorate at the University of Virginia. He currently teaches Asian Religious Traditions, Buddhist Religious Traditions, Hindu Religious Traditions, Buddhism in America, Buddhist-Christian Monasticism, Sanskrit, and Pali I and II at Western.





# DOING THE DIRTY WORK

BY TOMMY NEWTON

THE SAYING "IT'S A DIRTY JOB BUT SOMEONE HAS TO DO IT" COULD APPLY TO DR. KUNLEI LIU'S CAREER IN CLEAN COAL RESEARCH. "WHY DO I WORK WITH COAL? COAL COMBUSTION IS DIRTY AND IT'S A HEAVY JOB. BUT IT'S FUN."

DR. LIU'S RESEARCH, AS WELL AS THAT OF STUDENTS AND OTHER FACULTY AT WESTERN KENTUCKY UNIVERSITY, HAS THE POTENTIAL TO BENEFIT THE PUBLIC, HELP BUSINESS AND INDUSTRY, CLEAN UP THE ENVIRONMENT, AND PROVIDE A MORE STABLE MARKET FOR KENTUCKY COAL.

Dr. Liu is involved with two major research projects to reduce emissions of mercury and other pollutants (carbon dioxide, nitrogen oxides, sulfur dioxides, organic matter) from coal-burning power plants, which produce fifty-six percent of the electric power in the United States.

By reducing the emission of pollutants, power plants would be able to meet federal regulations and Kentucky's high-sulfur coal would remain economically viable. Without clean coal technology, many power plants would be forced to shut down.

The combustion lab, established in 1992, has been involved with numerous projects to study emissions of nitrogen oxide, sulfur dioxide, organic matter, and mercury

during combustion as well as after combustion. The lab's fluidized-bed combustion system has logged more than 8,000 hours of testing since 1995.

"If we can burn coal much cleaner, it will benefit people, it will benefit the coal industry and it will solve environmental problems," Liu said.

The combustion laboratory is one of the five laboratories in North America capable of conducting Continuous Emission Monitoring (CEM) and the Ontario-Hydro Method (OH method) for mercury emissions in power plants. WKU's mobile mercury monitoring laboratory (a 53-foot semi-trailer) is used at power plants to collect samples from flue gas, fly ash, or ambient air, and then analyze them for mercury.

Dr. Liu's clean coal work is rooted in his native China, where he received his bachelor's degree in power engineering and his master's and doctorate in thermoenergy engineering at Southeast University. From 1993 to 1997, he worked on combustion projects at Southeast University. He was coordinator of the combustion laboratory at WKU from 1997 to 2001. Then in 2001, he left Bowling Green for an engineering position in Knoxville, Tennessee, but he returned to Western in 2002 as an associate professor in the Department of Architectural and Manufacturing Sciences. His duties don't end there. He is supervisor of the Center for Advanced Combustion Engineering in the Institute for Combustion Science and Environmental Technology, and he's a husband and father of two children.

"I like a challenge," he said, "and reducing emissions from coal-fired power plants is a big challenge."

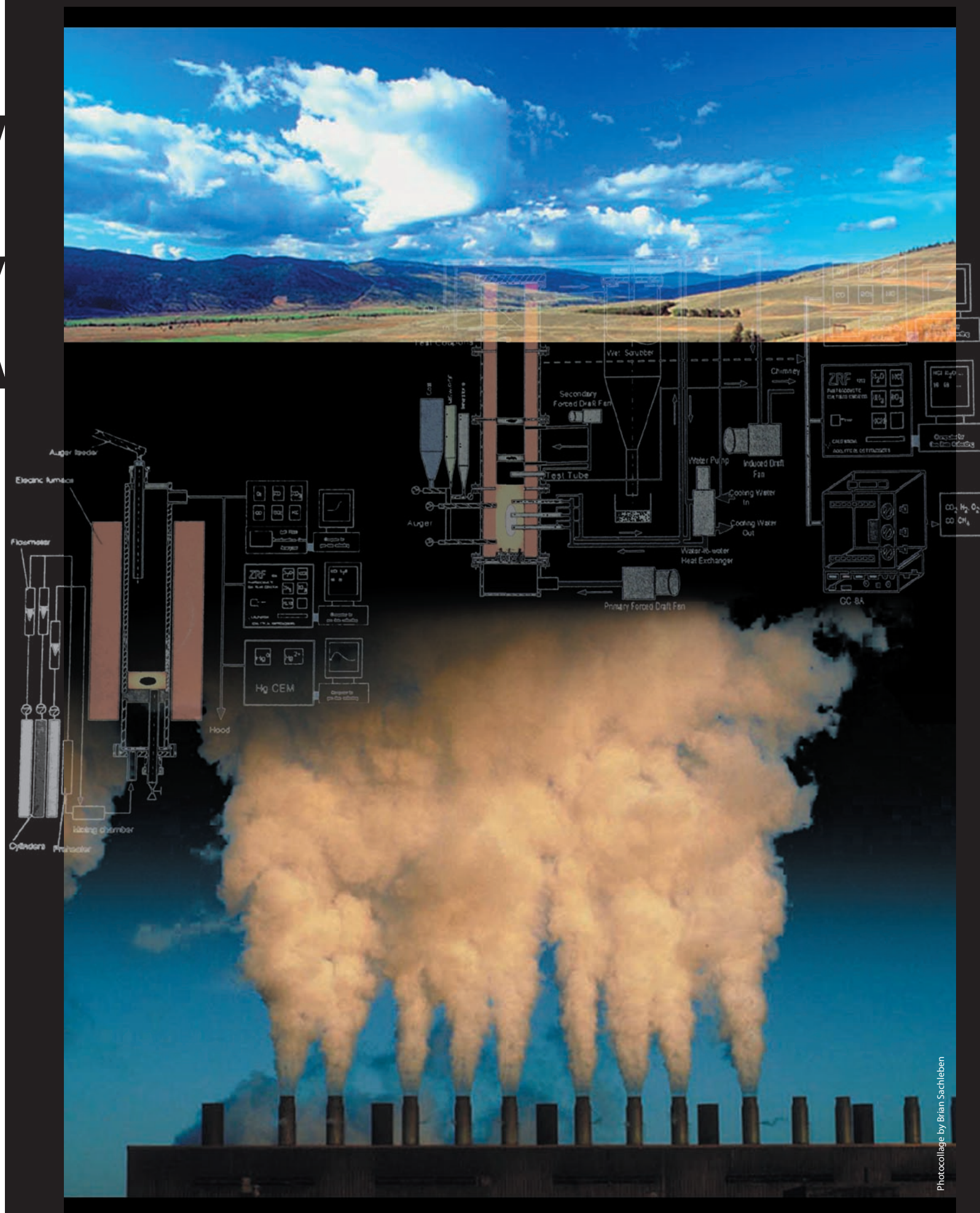
Western's Institute for Combustion Science and Environmental Technology and Materials Characterization

## Continuous Emission Monitoring (CEM):

Machines, which measure, on a continuous basis, pollutants released by a source. The EPA's regulation on mercury emission requires continuous emission monitoring systems for certain large sources.

## Ontario-Hydro Method (OH method):

standard method that was specified by EPA and ASTM to determine mercury concentration and its speciation in flue gas generated from utilities boilers.



Photocollage by Brian Sachleben



**EMISSIONS:** Release of pollutants into the air from a source.

**MERCURY:** A naturally occurring element that is present throughout the environment. Human activity can release some of that mercury into the air, water and soil. In the United States, coal-fired power plants only release 1 percent of overall mercury emission.

**CARBON DIOXIDE:** A colorless gas that is released into the atmosphere when fossil fuels (oil, natural gas and coal) and wood or wood products are burned. CO<sub>2</sub> is one of the main greenhouse gases.

**NITROGEN OXIDES:** Gases often formed from fuel nitrogen when fossil fuels, including gasoline and coal, are burned at high temperatures in air to generate electric power and that are a chief component of air pollution that contribute to the formation of smog.

**SULFUR OXIDES:** SO<sub>x</sub> gases are formed when fuel containing sulfur, such as coal and oil, is burned, and when gasoline is extracted from oil, or metals are extracted from ore. Fuel combustion, largely from electricity generation, accounts for most of the total sulfur dioxide (SO<sub>2</sub>) emissions, which is a component of acid rain.

Center have developed quite a reputation for clean coal research. The programs, under the direction of Wei-Ping Pan and John T. Riley, have steadily grown and have received millions of dollars in external funding as U.S. power plants are looking for ways to reduce emissions to meet federal regulations.

Mercury pollution has been known to cause neurological and developmental damage in humans. The

looking at several ways to reduce emissions of mercury and other pollutants in the combustion process. Those include injecting materials at various locations in a combustion chamber to capture the mercury, carbon dioxide, nitrogen oxide, and sulfur dioxide.

In the fall of 2003, Western's clean coal research received a \$2 million grant from the U.S. Department of Energy for "Establishment of an Environmental Control

Energy Technology Laboratory in Pittsburgh that includes about twenty universities and fifteen companies.

The primary objective of the WKU project is to establish an Environmental Control Technology Laboratory (ECTL) using a multifunctional circulating fluidized bed combustion (CFBC) system. The system can be easily configured to make combustion runs with various fuels under varying conditions to analyze and monitor air pollutant emissions,



Photo by LaDonna Harmon

*"If we can burn coal much cleaner, it will benefit people, it will benefit the coal industry and it will solve environmental problems," Liu said.*

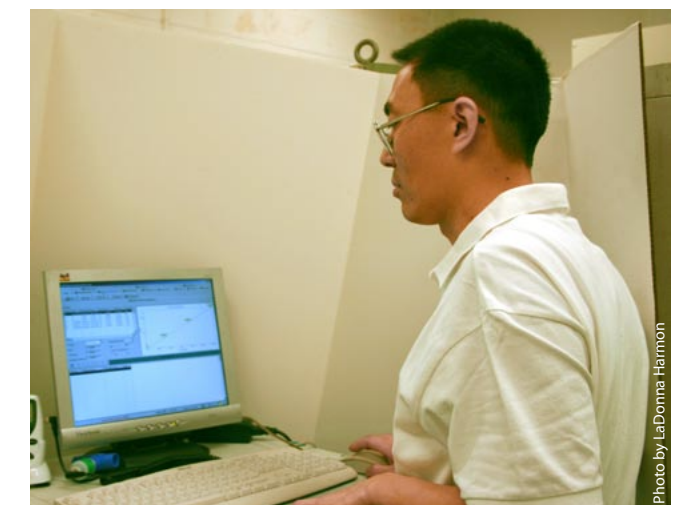


Photo by LaDonna Harmon

Environmental Protection Agency and other organizations have supported proposals to measure and reduce mercury emissions.

U.S. power plants emit about forty-eight tons of mercury per year and EPA regulations call for that amount to be reduced thirty percent by 2010 and seventy percent by 2018.

Dr. Liu uses the following to illustrate the challenge of measuring and reducing mercury emissions: The Astrodome would hold thirty billion ping-pong balls with thirty of those representing mercury. To meet EPA requirements, twenty-one of the thirty balls would have to be removed.

In their research, Western faculty and students are

Technology Laboratory with a Circulating Fluidized Bed Combustion (CFBC) System," and approximately \$2 million in grants and contracts from funding agencies and industries for "Mercury Emission Survey and Control."

Construction at Western's Center for Research and Development is expected to begin this summer with completion of the CFBC system by the summer of 2005. The CFBC system is a process for burning chunk coal that is poured in a liquid-like stream with air or gases. The process reduces sulfur dioxide emissions from coal combustion directly. The combustor at the facility will be seventy to eighty feet tall.

The grant award was made through the Combustion Technology University Alliance, a program at the National

as requested by the lab's industrial partners.

As part of the research to reduce emissions, Dr. Liu and others are investigating methods to capture and store the pollutant of CO<sub>2</sub>, a greenhouse gas.

One way of "sequestration," an innovative way of using fossil fuels without releasing the carbon into the air, is by using aqueous ammonia to convert carbon dioxide into ammonium carbonate to create a fertilizer. Western's research will include a small ecosystem to test that method.

Other power sources, such as nuclear, solar, wind, and hydroelectric, offer clean alternatives but they are not developed enough to meet U.S. demands, Dr. Liu said. Therefore, researchers must find ways to clean coal.

It's a dirty job, and Kunlei Liu is having fun while doing it.



# HILLBILLY

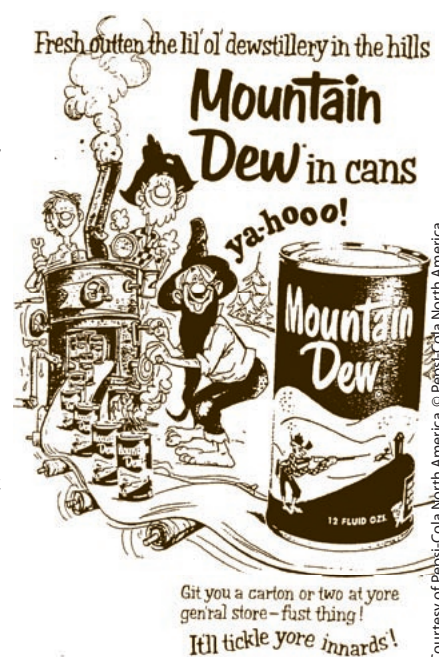
## AN AMERICAN ICON

BY CAROL CUMMINGS

JETHRO, GRANNY, ELLY MAY, AND JED CLAMPETT. THE MERE MENTION OF THEIR NAMES BRINGS SMILES TO FACES AND MEMORIES TO MINDS. AND WHO CAN FORGET THE “CANTANKEROUS COMIC STRIP MOUNTAINEER,” THE LAZY SNUFFY SMITH?

Anthony Harkins, assistant professor of history at Western Kentucky University, has spent much of his career researching the concept and history of the hillbilly. He first became enthralled with the topic while conducting research on 1950s Cold War comic strips for his master’s thesis. “I thought about Snuffy Smith, and I realized that the image of the hillbilly remained completely unchanged from the 1950s to the 1990s,” he said. “I then started thinking about the places I had seen it from a national audience perspective.”

From these early musings, Dr. Harkins’s doctoral thesis and the book *Hillbilly: A Cultural History of an American Icon* were born. Published in 2004 by the Oxford University Press, the book traces the origin of the hillbilly from the early 1700s to contemporary America. “The hillbilly is an image — a media construction. It has no absolute clear parameters, but it is primarily used to describe people from rural America, generally the South, who are pretty universally white



and who either culturally or ideologically have made themselves distinct from modern urban society,” Dr. Harkins said.

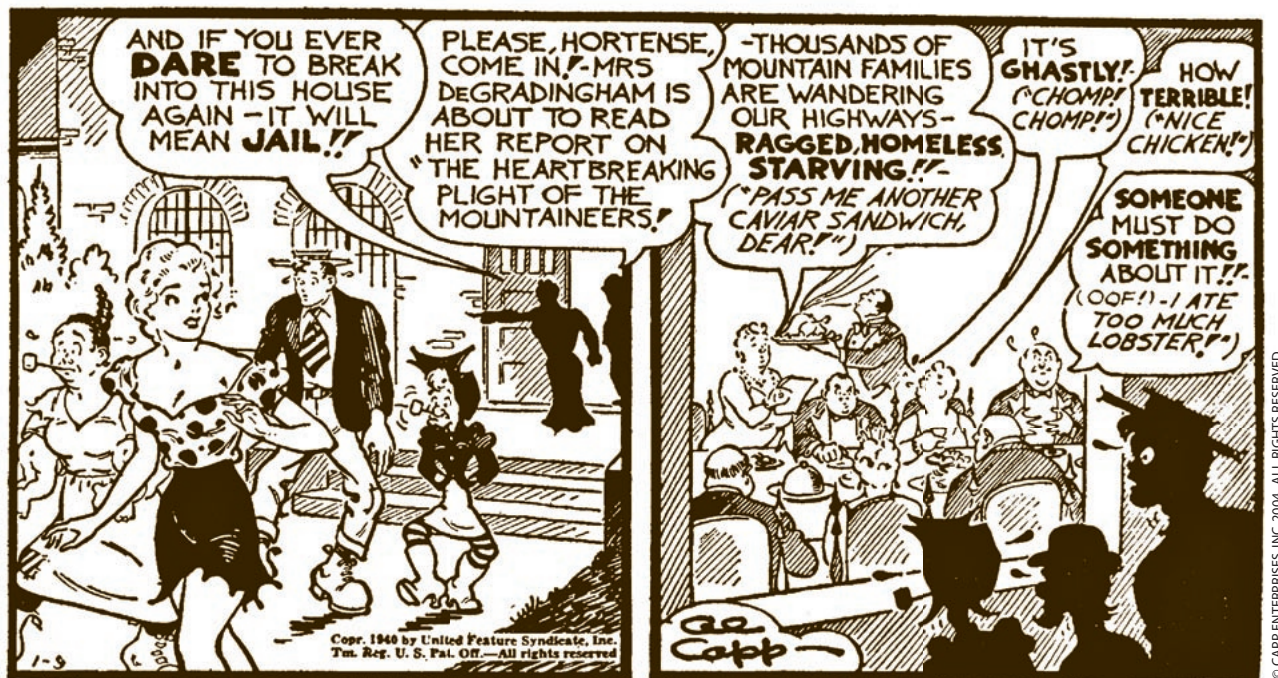
“From the positive aspect, the term hillbilly celebrates people who have a clear sense of self, a connection to the land, a strong sense of family, and a deep religiosity,” he continued. “On the negative side, the term hillbilly often brings to mind thoughts of primitive barbarians, inbreeding, moonshining, feuding, ignorance, and hostility to progress.”

Dr. Harkins writes that some of the earliest images came through stories of “mountain people” in Appalachia in the 1700s. “One of the earliest descriptions of the southern mountaineers comes from a 1780 announcement to the people of Virginia from British Major Patrick Ferguson about the dangers of the ‘Back Water men’ who had marched from eastern Tennessee to the South Carolina border and would defeat his troops a week later at the Battle of King’s Mountain in South Carolina. Ferguson warned urban Virginians that they should join Tory forces unless ‘you wish to be eat up by an inundation of barbarians . . . who by their shocking cruelties and irregularities, give the best proof of their cowardice and want of discipline.’”



PHOTO COURTESY OF PAUL HENNING COLLECTION





"Li'l Abner" was one of several syndicated cartoon strips that found humor in hillbilly characters.

Though closely related to this backwater persona, Daniel Boone and David Crockett brought a more heroic image as the "glorified backwoods frontiersman." Dr. Harkins writes that Boone, in particular, "became a leading symbol of American masculine prowess after leading settlers through the Cumberland Gap into Kentucky, fighting and killing Indians, and taming a savage wilderness." He adds that Crockett also became a more direct representation of the hillbilly persona. "Like Boone, he represented the heroic frontiersman, Indian fighter, and big game hunter. In his own day he also symbolized backwoods ignorance and rough humor. Elected repeatedly to the Tennessee state legislature and the U.S. House of Representatives, he was nonetheless ridiculed by more cosmopolitan legislators for his backcountry origins."

Of all the earliest tales of Appalachia, perhaps none is as well known as that of the Hatfield and McCoy feud of the 1880s. "Neither the first, longest, nor bloodiest interfamilial conflict in the southern Appalachians, the two families nonetheless rapidly became household names, a dubious distinction that has lasted for over 100 years," Dr. Harkins writes. "Countless articles and several books... presented a portrait of 'Devil Anse' (William Anderson) Hatfield and 'Old Ranel' (Randolph) McCoy and their relatives as savage and isolated mountain people living in 'Murderland' to whom family loyalty mattered above all else and who were ready, even eager, to use deadly violence against rivals and law enforcement officials."

Dr. Harkins writes that the actual conflict had more to do with interstate rivalry and economic disputes than

an actual "culture of violence," but most accounts took more artistic liberties and presented the feud as a "prime example of irrational violence and dangerous ignorance of all rural people of the region."

The term "hillbilly" was actually born at the turn of the twentieth century. Harkins writes that though its cultural origins are rather murky, the most credible theory is that Scottish highlanders linked two older Scottish expressions, "hillfolk" and "billie" (another word for "companion" or "fellow"). The term first appeared in print in a 1900 New York Journal article that stressed the allure of this persona to Americans who lived outside the region. Political correspondent Julian Hawthorne defined a "hill-billie" as a "free and untrammled white citizen of Alabama, who lives in the hills, has no means to speak of, dresses as he can, talks as he pleases, drinks whiskey when he gets it, and fires off his revolver as the fancy takes him."

The term continued to evolve throughout the early twentieth century, until country music played an important role in promoting the term. "Country music's identity was so completely intertwined with the 'hillbilly' concept that between its commercial origins in the 1920s and its emergence as a major cultural force in the 1950s it was nearly universally known as 'hillbilly music,'" Dr. Harkins writes. "Beyond nationalizing the term, country music also replaced the term's dominant pre-World War I association with violence and threat with a new principal denotation of unpretentious humor, carefree frivolity, and grassroots authenticity."

In the November 1934 issue of Esquire magazine, Paul

Webb's cartoon series, later named "The Mountain Boys," premiered, beginning a more than twenty-three-year run finding humor in the hillbilly characters. This cartoon was one of three hillbilly comics that premiered that year, along with Billy DeBeck's "Barney Google" and Al Capp's "Li'l Abner." Barney Google was eventually replaced by the more outrageous "Hootin' Holler" character of Snuffy Smith, whom Dr. Harkins describes as a "stocky and ornery mountaineer... ignorant of all things modern, he makes his meager living by moonshining and stealing chickens and horses, and responds to all comers with the threat of his omnipresent squirrel rifle."

"These deliberately exaggerated portraits of impoverished, but basically content, southern hill folks also provided cheering reassurance that rural poverty was not as bleak as it appeared in news accounts," Dr. Harkins explains. "From a cynical perspective, these comics and cartoons offered the pleasure of laughing at the misfortune

as Ma and Pa Kettle achieved outstanding success through the 1950s.

"Despite the unusually absurd plots and outlandish actions and attitudes, the genuine humanity of the Kettles and their vast brood always shone through. Ma Kettle may have been capable of brandishing a shotgun to drive away local authorities trying to repossess her house... but she loved her husband and family and always lent a helping hand to a neighbor in need."

From the 1950s to the early 1970s, the hillbilly made its way to the living room in a steady stream of highly successful situation comedies, including "The Real McCoys," "The Andy Griffith Show," and "The Beverly Hillbillies," which was the most successful of the three. "The show became the top-rated show by the end of its first month, was the highest rated show of 1962 and 1963 television seasons, and never fell from the top twenty until its final years," Dr. Harkins writes. The show also moved

**The term "hillbilly" was actually born at the turn of the twentieth century. Harkins writes that though its cultural origins are rather murky, the most credible theory is that Scottish highlanders linked two older Scottish expressions, "hillfolk" and "billie" (another word for "companion" or "fellow").**

of others, and even confirmation of the belief that the poor deserved their poverty because of innate laziness and ignorance. But they could also at times reflect a more sanguine vision of the durability of the American people and the American spirit in the face of adversity."

Throughout the early- to mid-twentieth century, the hillbilly came to Hollywood on film, as these rural characters were depicted in numerous "cookie-cutter-feud-and-moonshine melodramas."

Dr. Harkins writes: "As the degraded cartoon hillbilly gradually lost favor with critics and audiences alike in the postwar years, however, the presentation of such primitive people in film transmogrified into the softer and more appealing conceptions of actors Percy Kilbride and Marjorie Main, who

dramatically away from the hillbilly stereotype, offering "escapism and security in an uncertain world" of the early 1960s.

*Hillbilly: A Cultural History of an American Icon* spans literature, film, and American pop culture in its entirety. The book is richly illustrated with photographs, drawings, and film and television stills.

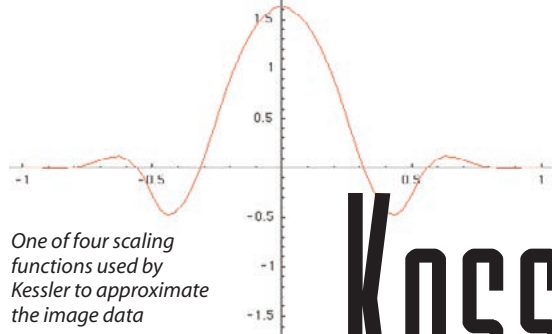
Dr. Harkins maintains that he "will not be Mr. Hillbilly forever," as his research interests are varied. He plans to move into more concrete research in the future, such as a study of Esquire Magazine and the mixing of cultural labels and boundaries. "I think my strength as a researcher is that I focus on national images and how audiences perceive them in combination with how they are portrayed," he said. "Pop culture is an important, legitimate field of history, and it can tell us a great deal about how we are in America and how we got that way."

PHOTO COURTESY OF WEST VIRGINIA ARCHIVES AND HISTORY



Tales of "Devil Anse" Hatfield (bottom row, second from left) and his family contributed to the stereotype of mountain people as violent feuders.





# Kessler's Compression

BY TOMMY NEWTON

THEY SAY A PICTURE IS WORTH A THOUSAND WORDS. TO BRUCE KESSLER, A PICTURE MAY BE WORTH A THOUSAND NUMBERS.

If you look closely at the photographs, you'll probably notice slight variations as the image has been compressed. The changes weren't made with a photo-imaging software program like Photoshop. They were made with mathematic-numeric processes using fractal functions and wavelets.

Through a series of algebraic formulas and equations, Dr. Kessler, an associate professor of mathematics, can filter and compress the raw data of the image file — the series of numbers used to create the actual image we see.

"I'm researching ways to apply fractal functions to image compression. Fractals are the kind of strange curves where if you take a piece of them and then zoom in on a little section of it, you'll see portions of the curve again. They're kind of self-repeating," Dr. Kessler explained.

"The idea of image compression is that you take the original raw data of the image, which is just whole numbers ranging from zero to 255, and somehow turn that into another set of numbers that can be stored more efficiently or transmitted faster over the phone lines."

Dr. Kessler said one way to visualize his use of fractal functions is to think of Lego blocks. Legos come in three sizes, small for older children, medium for younger children, and big for toddlers.

"Using the small Legos, you can build things with a lot of detail, but as you use larger Legos, you lose the ability to build with as much detail," he said. "What I do with images is like building it out of the small Legos, and then rebuilding it out of the medium Legos and keeping track of the error. Then I rebuild it out of the big Legos and keep track of the error at that step."



Dr. Bruce Kessler original image with file size 256 Kb

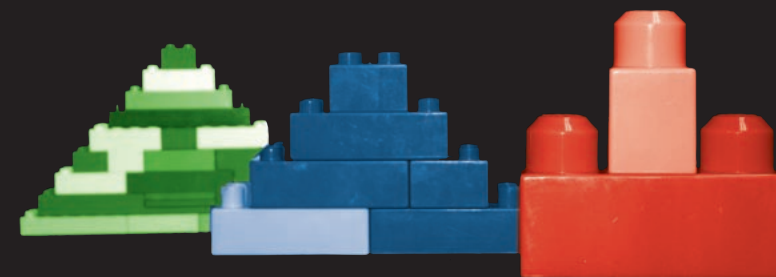


Reconstructed image from a file 1/32 the size of the original using Kessler's approach



Reconstructed image from a file 1/64 the size of the original using Kessler's approach

**"The idea of image compression is that you take the original raw data of the image, which is just whole numbers ranging from zero to 255, and somehow turn that into another set of numbers that can be stored more efficiently or transmitted faster over the phone lines."**



**"Using small Legos, you can build things with a lot of detail, but as you use larger Legos, you lose the ability to build with as much detail. What I do with images is like building it out of the small Legos, and then rebuilding it out of the medium Legos and keeping track of the error. Then I rebuild it out of the big Legos and keep track of the error at that step."**

If the error is fairly small, then I can store the image more efficiently. My goal is that the loss of detail is not too noticeable. The better the set of functions that I use to 'build' the image, the less noticeable the loss of detail is."

The growth in digital technology has driven Dr. Kessler's research. He and Doug Hardin, his Ph.D. adviser at Vanderbilt University, have been working on wavelet theories and fractal functions for several years.

Dr. Kessler, who earned his bachelor's degree at Western, was attracted to the cutting-edge image compression research because it has numerous applications for business, industry, and science.

The FBI is using similar technology to compress fingerprint data, and images transmitted from the Mars rovers could be stored more efficiently and received more quickly.

"I'm doing fairly well. I'm not ready to have any patents yet. And nobody has paid me a million dollars for these ideas," he joked. "I'll settle for a good number of publications and notoriety among my peers."

One application that he's working on involves edge detection or the enhancement of edges in images. For example, in surveillance video the technology could be used to enhance distinguishing traits, such as a tattoo, to assist law enforcement agencies.

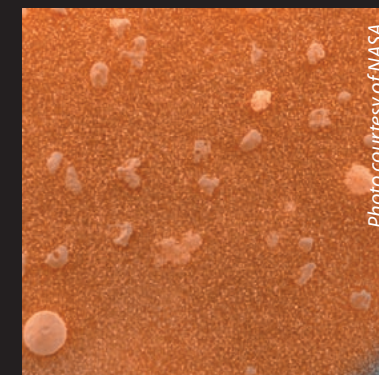
"It would be nice to do something innovative," he said.

Dr. Kessler has been on sabbatical during the entire 2003-04 academic year thanks to a grant from the Kentucky Science and Engineering Foundation.

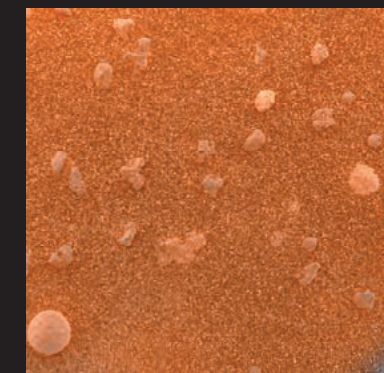
He also has received a research enhancement grant from the National Science Foundation through Kentucky EPSCoR (Experimental Program to Stimulate Competitive Research) that will allow two undergraduate students to assist in the project and present results at several conferences.

"If I can just advance what's known and make some good contributions to the field, I'll be happy," Kessler said.

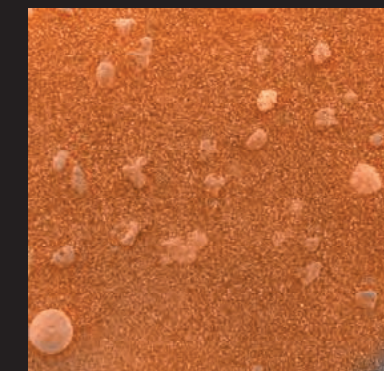
"The research does have some nice applications. I'd feel a lot better if I were saving the world somehow or another, but this is who I am and this is what I do. There is the possibility of doing some good things."



Original Mars Rover photo, size 256 Kb



Reconstructed image from a file 1/32 the size of the original



Reconstructed image from a file 1/64 the size of the original



# Rediscovering a LOST GENERATION of East German Film Directors

BY BOB SKIPPER

*Dr. Laura McGee's interest in Germany goes back to high school when she spent time in Berlin as an exchange student.*

Photo by LaDonna Harmon

**EAST GERMANY IN THE LATE 1980S WAS A COUNTRY SURROUNDED BY CHANGE. A FAILING ECONOMY AND CALLS FOR REFORMS LED TO THE FALL OF THE BERLIN WALL AND A UNIFIED GERMANY.**

"There were protests. There were demonstrations. There were groups that met and tried to speak with the government and get things changed, and those are part of what made the peaceful revolution possible in East Germany," said Dr. Laura Green McGee, assistant professor of German at Western Kentucky University.

Of particular interest to Dr. McGee is a group of film directors who were educated in the former German Democratic Republic. "I was looking specifically at the very last generation of film directors educated in East Germany, people who were born between 1949 and about 1963. The majority of them were approximately as old as the country itself," Dr. McGee said.

the materials for her current project, "Eastern Identity in Post-Unification German Film." In 2002, she received a Fulbright Research Grant.

"My project really starts in 1988 when the politics in the film studios changed a little bit, with the precursors to the fall of the wall when things were beginning to shift in the GDR," Dr. McGee said. "A number of very interesting films were approved in 1988, things that would not have been allowed before then. These were critical, and at the same time artistically innovative films. People weren't paying much attention to them because by the time they came out, the wall had fallen and people in East Germany were suddenly interested in something else."

Her research revealed that films produced by that generation at that point in time were largely overlooked. "When the films were made, they were supposed to be contemporary



Photos by Robert Laatz

*Directors Maxim Dessau, Evelyn Schmidt, and Andreas Kleinert. Dessau was directing a film, "Schnauzer," until the project was interrupted in 1984 and the film stock destroyed in the late 1980s. Schmidt now directs youth theatre in the former East Berlin.*

"These artistic people — film directors — wanted to show certain things and wanted to say certain things in the state, but East Germany took an approach of slowing them down, of making them compromise," she said. "While the state didn't just outright forbid things, it required revisions and sent scripts back and it took forever to complete a film. These directors were in their mid thirties and approaching forty, trying to make their first films," explained McGee.

"They thought it was terrible that the energy and the imagination of the youngest, brightest next generation was being wasted. They wanted to see change. They didn't necessarily want East Germany to go away altogether, which is what happened, but they wanted change," she said. "So you can see the film studios as kind of a microcosm of the same thing that was happening in East Germany."

Dr. McGee's interest in Germany goes back to high school when she spent time in Berlin as an exchange student. She has returned many times, including a six-month stay in 1995 on a German Academic Exchange Service fellowship. In 1999, she received a junior faculty research grant to begin gathering

films, but by the time they were finished, they were historical documents, you could say, and for young film makers trying to establish themselves in their careers, this was a very unfortunate thing to have happen."

The first phase of her project looks at a group of twelve directors from that generation. "I conducted the research by reading about and viewing the films that these directors had made," she said. "I looked at their entire careers to try to get a feel in the case of each of them about what types of films they made before the fall of the wall, so that I had a better understanding of what types of films they made after the fall of the wall."

Later phases of the project examine what this generation has done in the way of film production since the fall of the wall. "I see a number of phases," Dr. McGee said. There are those directors who look back at the past in East Germany to try to understand who they are in the present, and to explore their identities in film.

"The films represent east and west getting to know each other and they represent some of the problems of Western



society — capitalist society — coming to the east,” she said. “Things like unemployment, poverty or homelessness, some of the negative sides that were not visible to them in the socialist society. In the east they just didn’t have those things to that degree.”

The unification of Germany changed the landscape for the directors, Dr. McGee said. “A number of the directors I’m working on didn’t make any films after the fall of the wall. It’s true of all of them that they had to adjust to different conditions for the production of film because the film industry in the east became dominated by the traditional systems that existed in the west. In the east things were very different. They had film studios with a process for putting stories through. The film studios employed thousands of people on a regular basis.

“With the fall of the wall, all of a sudden the film industry in the east looked more like the film industry in the west where a director who has an idea has to go to different sources to secure funding, just like it is in the United States. In Germany there is also funding for cultural projects, such as film, that runs through the state. And that money is awarded by committee, and many people who sit on those committees are established in the western film industry and they might not know people who have established themselves in the eastern film industry. So there is a perception, at least on the part of the easterners, that a bias exists.”

Dr. McGee did much of her research at the Academy for Film and Television in Babelsberg, which sponsored her during her stay and provided her an office. The school’s resources included both secondary literature and the films themselves since the directors studied at the school.

She also interviewed the directors, using a digital video camera and working with a cameraman, Robert Laatz, who had graduated from the school. Excerpts from some of those interviews may be used in a documentary about the school, which turned fifty in 2004.

“That was great fun to visit the directors in their homes,” Dr. McGee said. “Usually when we did those interviews, we were there five or six hours at a time and recorded two to two and half hours of material.” She is now busy transcribing, editing, and translating those interviews for publication. In teaching film courses at Western, she often uses authentic materials from her research project.

“I think it’s exciting for my students to see that I received something like a Fulbright,” she said. One of Dr. McGee’s graduate students, Nicole Langley, recently received a Teaching Assistantship in Austria, administered through Fulbright. “I think it’s been really empowering for my students to see that you can research your options and look for support for what you want to do.”

She has had an article published in *Film History*, *An International Journal*, titled “Revolution in the studio? The DEFA’s fourth generation of film directors and their reform



The historic entry to the Babelsberg Film Studios, the Hollywood of Germany, still stands – though it now marks the entry to a complex of many different film and television production companies. Before the fall of the wall, the studios employed over 2000 workers in the East German film industry. They now provides production capacity for German and international co-productions, and are attractive to major American film production companies, such as Universal Studios, which made *Around The World In 80 Days*, *Beyond The Sea*, *The Bourne Identity*, and its sequel *The Bourne Supremacy* here.



Director Andreas Dresen at a summer 2003 interview in Potsdam. One of the youngest directors in McGee’s subject group, Dresen is also one of the most successful.

Cameraman Robert Laatz, a graduate of the Academy for Film and Television Konrad Wolf in Babelsberg, assisted Laura McGee by filming a number of her interviews with directors in Berlin.



Photos by Laura McGee

After German unification, the Academy for Film and Television Konrad Wolf moved into a new building directly adjacent to the Babelsberg film studios, outside Berlin. It is one of the premier institutions for the study all aspects of film and television production in Germany.



Film viewing stations for students and researchers at the Academy for Film and Television Konrad Wolf in Babelsberg.

The “Cinema International” in the former East Berlin premiered many of the most important of the nation’s films. It is still a landmark in Berlin’s cinema history.



Director Andreas Kleinert with Laura McGee after the filming of an interview at his home in the former East Berlin.

efforts in the last decade of the GDR.” The article details the political activities of the young directors at the film school that helped to define this group. The DEFA (Deutsche Film-Aktiengesellschaft) refers to the state owned studios of the former German Democratic Republic.

“The group banded together in the interest of liberalizing film production at the film school,” she explained. “They went to the studio administration and to the administration of the film school and said ‘we want to be able to make films more quickly. We want to make films that show things the way they really are so the people will talk about them. We want to be able to see more international films.’ They had quite a list of demands. So that helped defined who they are. It is quite interesting to note that this political action on their part in the 1980s runs parallel to the activities of intellectuals and of writers who were behind the political movement that pushed forward the fall of the wall.”

A group of young filmmakers produced a manifesto in 1988 that was to have been read and discussed at the Fifth Congress of the Association of Film and Television Workers of the GDR. It was suppressed by government agencies before the event. The translation, which appears in Dr. McGee’s article includes:

*Motion pictures are a medium of society. Stagnation in the control of influence over our motion pictures and the social processes evident in recent years represents principally the surrender of our responsibility, but at the same time the expression of the social condition. Society must reveal itself in every aspect to the motion pictures. It must trust this medium and challenge and support it. We declare our willingness to actively and positively cooperate in the socialistic development of our society and to assume responsibilities.*

She has also written “The End Phase of the GDR in Films by DEFA,” which appeared in *German Studies Review*.

“There’s very little out there in English about these individuals or about this particular phenomenon,” Dr. McGee said. “I think this generation had something to say and due to the way that the culture industry has developed in the unified Germany, they have not been heard to an extent that could benefit people on both sides of the wall, but particularly in East Germany.”

Eventually, Dr. McGee plans to produce a book on her research, but notes that is an ambitious project. “It was such a luxury to be in Germany and to be able to focus on just one thing,” she said. “We do so many different things here at the university. We wear so many different hats, and it was a little tough to adjust to that when I got back.”

She’s grateful to Western for funding her early research and working with her on the Fulbright award, which took her away from teaching for a year. “I’m really thankful to Western for supporting me.”

Dr. McGee has a Ph.D. in German literature from the University of Washington, a master’s degree in German language and literature from Ohio State University and a bachelor’s degree in German literature from Davidson College.

Photos by Laura McGee

Photo by Robert Laatz





***“For years, body image studies have focused on women. However, it appears that men are becoming more and more concerned with body appearance. Muscle dysmorphia is a newly described disorder which affects mostly men ...”***

Photo By Sheryl Hagan-Booth

# Body Beautiful?

BY CAROL CUMMINGS

**FEMALE BODY IMAGE AND BARBIE. WE HAVE ALL HEARD ABOUT UNREALISTIC IDEALS FOR WOMEN’S BODIES AND HOW THOSE CAN AFFECT THEIR SELF-ESTEEM. BUT HAVE YOU EVER THOUGHT ABOUT MALE BODY IMAGES AND G.I. JOE? RICK GRIEVE HAS.**

Dr. Grieve, an associate professor of psychology and coordinator of the clinical psychology master’s program at Western Kentucky University, has expanded his research into traditional eating disorders to include eating disorders and muscle dysmorphia in males.

“Muscle dysmorphia relates to a distortion in perception,” Dr. Grieve said. “Big body builders might have a distortion in how they look at themselves. They may think they are too small, so they exercise to the exclusion of everything else, sometimes hiding their bodies or resorting to illegal supplements.”

According to Dr. Grieve, while women aspire to the thin ideal, the ideal for men is not to be thin — it is to be muscular. He has therefore conducted two research studies on the thin to muscular continuum.

“I first looked at what things contribute to male dysmorphia,” he explained. “I looked at lifting weights as a factor, as there are healthy and unhealthy patterns to body building. I also looked at healthy and unhealthy eating patterns.”

Dr. Grieve writes: “For years, body image studies have focused on women. However, it appears that men are becoming more and more concerned with body appearance. Muscle dysmorphia is a newly described disorder which affects mostly men, particularly those who engage in weight lifting or body building.”

Individuals with muscle dysmorphia believe they are not muscular enough,

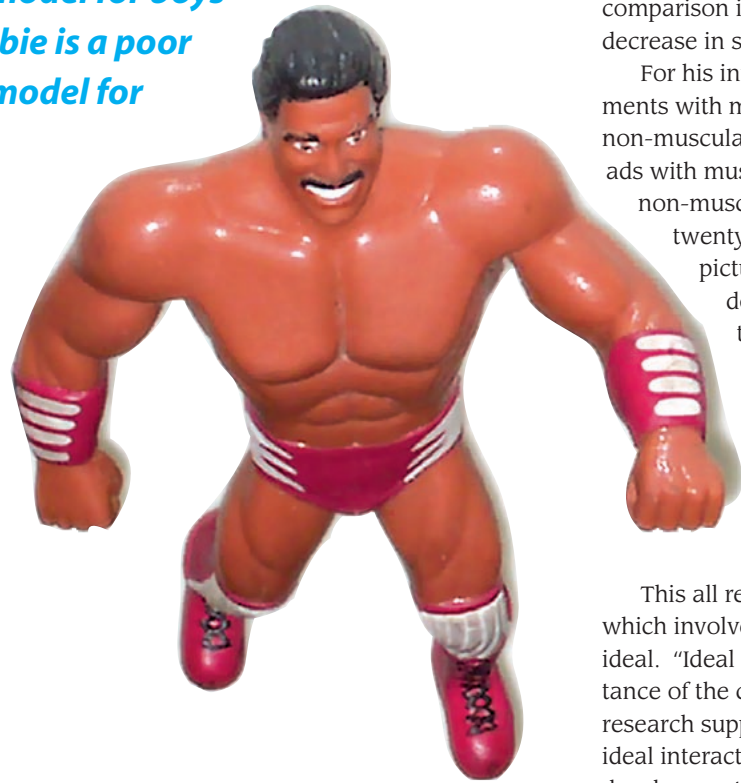


Photo By Sheryl Hagan-Booth

Dr. Rick Grieve researching muscle dysmorphia in males.



**“Male action figures appear to be as poor a body model for boys as Barbie is a poor body model for girls.”**



Dr. Grieve says, even though they are often more muscular than so-called “average people.” They hold a preoccupation with body shape that is persistent and causes impairment or distress.

Dr. Grieve said perceptions of the ideal male body have changed dramatically over the years. “G.I. Joe even looked normal years ago,” he said with a laugh. Now G.I. Joe has been transformed into a muscular, larger-than-life “he-man.” He writes: “Action figures, in particular, have undergone a transformation from being representations of normal-shaped men in the 1970s to having body shapes that are virtually unattainable by the majority of the population in the 2000s. Now, male action figures appear to be as poor a body model for boys as Barbie is a poor body model for girls.”

What Dr. Grieve found is that when an individual’s actual self falls short of his ideal self, he is more likely to develop unhealthy patterns. Other things he considered were external stressors, such as images of movie actors and *Playgirl* centerfolds. “Also, there has been a marked increase in naked or nearly naked men in advertising, particularly for products such as alcohol, cologne, and clothing,” he said.

The research looked at the effect such advertisements had on men. He writes: “Media advertisements generate social comparison. As the number of male bodies in advertisements increases, the opportunities for such a comparison increase. Social comparisons can lead to a decrease in satisfaction with current body shape.”

For his initial study, Dr. Grieve selected six advertisements with muscular men and six advertisements with non-muscular men. One group of men reviewed the ads with muscular men, and one reviewed the ads with non-muscular men. Participants were asked to rate twenty-five areas of their bodies and to rate the pictures. Questions included: How attractive do you think women find these men? Are they muscular? Are they healthy? Are they intelligent?

“The men who looked at the muscular pictures had a slight but significant increase in their own body dissatisfaction,” he said. “Men who looked at the non-muscular pictures had an insignificant increase.”

This all relates to the internalization of the ideal body, which involves an individual’s acceptance of the cultural ideal. “Ideal body internalization involves the acceptance of the cultural idea,” Dr. Grieve said. “Current research supports that the internalization of a thin body ideal interacts with other variables to contribute to the development of eating disorders in women. Body image is one of the primary factors influencing a person’s desire to lose or, in the case of muscle dysmorphia, gain weight.”

Dr. Grieve said women still bear the lion’s share of all eating disorders, with ninety percent of all individuals affected being female. “However, the number of males with these disorders is a phenomenon that is large enough to merit further study,” he said.

Dr. Grieve received his bachelor’s degree from Central Michigan University and his master’s and doctorate from the University of Memphis. He completed his pre-doctoral internship at the University of Mississippi and Jackson Veterans Affairs Medical Centers Consortium and a post-doctoral internship at Harriett Cohn Mental Health Center in Clarksville, Tenn. He has been a member of Western’s faculty since 2002. His other research interests include sport psychology (sport fans and optimism in sport), factors influencing weight loss and weight maintenance (group dynamics, role of hedonics, self-efficacy, eating beliefs, and social physique anxiety), decision-making (counterfactual production and jurors’ decisions), and anger management treatment issues.





**BY BOB SKIPPER**

**DR. JOHNNY CHAN SAYS HE'S FOUND HIS DREAM JOB.**

**"I ENJOY THE WHOLE RESEARCH-TEACHING PROCESS," HE SAID. "IT'S AMAZING AND FUN. AND I GET PAID TO DO IT."**

Dr. Chan came to Western Kentucky University in 2003 as the Leon and Ruby Mai Page Chair in the Department of Accounting and Finance. He brought with him a passion of doing research and teaching that has fueled a prolific publishing career that includes more than fifty articles in refereed journals.

His publication schedule has not waned since he arrived at Western. In less than nine months since he joined Western, Dr. Chan has had ten articles published or accepted for publication. He

# Enjoying the Process





Photo By Sheryl Hagan-Booth

has been selected in a study of researchers as the leading author in financial education from 1991 to 2003, and was chosen in a survey as one of the top 100 researchers in terms of the number of financial publications over the past thirty years.

"I think the key is that you have to enjoy the classes, enjoy reading, enjoy writing your thoughts out and trying something new," Dr. Chan continued. "Sometimes the research may not work, but in those cases you just have to bury that research project and move on to something else. A lot of the time a little thing today may help you out five, six, ten years later."

While he did research in fixed income, mutual funds, real estate, and exchange rates, much of Dr. Chan's current research is focused in two areas: derivatives and financial education. Dr. Chan examines index options to see how they provide information on stock market volatility, how that volatility relates to stock market movements

and index futures movements and the interrelationships among index options, index futures and the stock market in general.

He also examines how different teaching methods, or pedagogies, could improve the student learning experience. It was during one such project — the effectiveness of collaborative learning — that Dr. Chan began to more fully understand and apply the selectivity bias concept that he was first exposed to as an undergraduate economics student.

Dr. Chan was comparing two classes to determine the effectiveness of collaborative teaching method in 1995. While many researchers would examine the grades of the students who completed the course, those methodologies did not take into

account students who dropped out, possibly because of the new teaching method. In this case, they would be missing a big chunk of data, he said.

"It is likely that a lot of researchers, when they do these

***"I enjoy the whole research-teaching process," he said. "It's amazing and fun. And I get paid to do it."***

survey research and class experiments, do not consider possible selectivity bias," he explained. "That is why the 1996 *Journal of Financial Education* paper became a very well cited paper, it was the first one that looked into the possible selectivity bias in student performance research. And that was the exciting part because I recalled something from when I was a college senior."

Ten years later, he understood the selectivity bias concept and applied it to research. "That just tells something about the lifetime learning concept and how a lot of times we might learn something we might not really understand at the time, but as long as we have some rough idea, a few years later, even ten years later in this case, you will be able to use it," said Chan. "You just have to enjoy the whole learning process and even if you don't use it the next day or next year, it will always come back. That's how I encourage my students. That's the exciting part."

Dr. Chan recently published a few articles on ranking finance departments. He calls this "research in the research of finance to see how different finance programs or finance departments rank in other parts of the world." The data were collected over a twelve-year period from 1990 to 2001, and he was able to track researchers who moved from one university to another as they continued to publish. As Dr. Chan explains, "In the past when people talked about academic department ranking, they just did the ranking without additional interpretation. That's why we received a lot of attention because when people think about moving from one job to another job, finance professors are interested in knowing the contributing factors. So it's more like an integrated economics-finance piece."

The integration of economics and finance are natural for Dr. Chan, who began his academic career as an economics major. He earned a bachelor's degree in economics from Chinese University of Hong Kong. He moved to the United States to work on a master's degree in economics at the University of Alabama. There a friend enrolled in an MBA-level finance class. "He asked me to accompany him to be a working partner, so to speak," Dr. Chan said. "I came across an excellent finance teacher and a very good scholar, Carolyn Carroll at the University of Alabama, and I found the finance subjects very exciting and very interesting."

In this kind of research, says Chan, "You pay a lot of attention to real-life situations. A lot of them are economics, but a lot are finance. This is kind of a good mix."

Since earning his doctorate, Dr. Chan has held tenured faculty positions at the University of Dayton, the University of Wisconsin-Parkside and Moorhead State University. He is also a Chartered Financial Analyst charter holder and is

serving a three-year term as a director of Midwest Finance Association.

His interest was always in the relationship between research and teaching. "I truly enjoyed the teaching process even when I was in the undergraduate program," Dr. Chan said.

"I guess over a long period of time, to continue a research program you naturally integrate teaching and research," Chan concluded. "You have to involve students in the process, and you have to really enjoy the process."

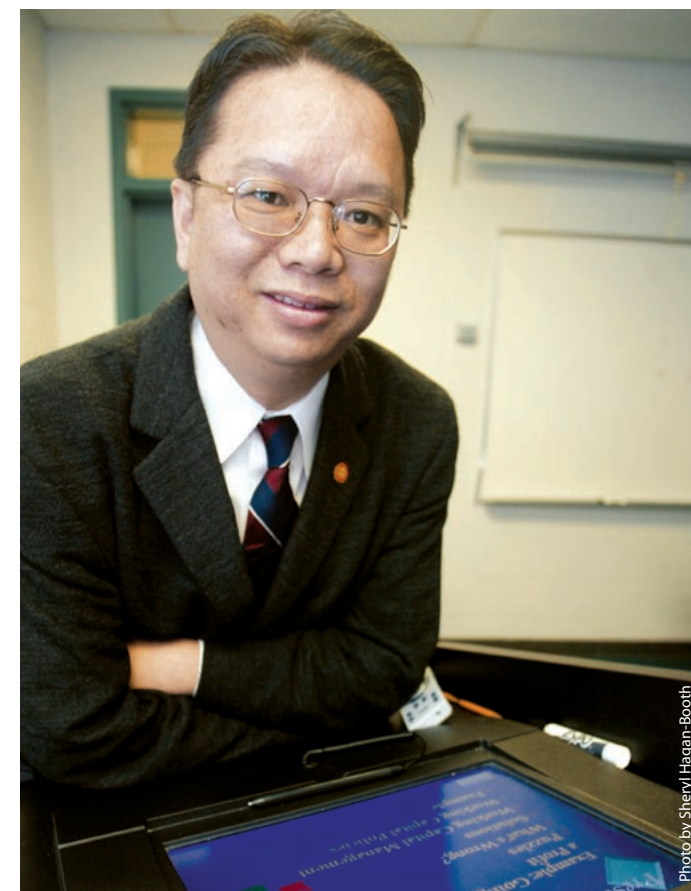


Photo by Sheryl Hagan-Booth

***"I guess over a long period of time, to continue a research program you naturally integrate teaching and research," Chan concluded. "You have to involve students in the process, and you have to really enjoy the process."***



# RESEARCH BRIEFS

## Increasing Student Learning

WKU is helping the Kentucky Education Professional Standards Board (EPSB) improve teachers' abilities to increase student learning. Western is administering research projects to a number of public and private higher education institutions under a \$3.9 million grant from the Board. Dr. Sam Evans, Dean of the College of Education and Behavioral Sciences, directs WKU's portion of this project. He is working with content specialists in teacher education, Dr. Richard Roberts; humanities, Dr. Larry Snyder; and science, Dr. Richard Gelderman.

The project has three parts: supporting curriculum review at universities to improve teachers' content knowledge; collecting and analyzing data to evaluate the priorities and objectives; and enhancing the existing Kentucky Teacher Internship Program by adding a mentoring component the first year and using teacher standards to develop ways to determine how new teacher performance affects student learning.

Phil Rogers, director of the division of testing, research and internship for the EPSB was instrumental in awarding this master agreement to WKU. In making the award Dr. Rogers commented that: "I don't know of another institu-



Dr. Sam Evans

tion that is set up like Western with a research foundation, except for the University of Kentucky." Acting as the fiscal agent for the award, Western's research foundation has disseminated fifteen subgrants to participating universities and school districts, and coordinated overall management and research functions of the participants. Dr. Evans remarks that: "We feel really positive about what the standards board is trying to do. We offered to assist. They had a need and we stepped up to fill that need." The selection resulted from the research foundation's winning bid that established a long history of handling large grants such as this one.

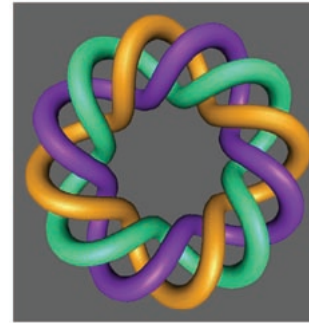
The project will fund the time to involve teachers and mentors in a more direct relationship than is now possible. Mentoring makes a huge difference in the success of new teachers, according to Dr. Evans, "I don't know of any other profession where a first-year worker is expected to do the same work as a twenty-six-year veteran." The results of these mentoring experiences will no doubt improve the research about mentoring to improve teacher-student relations and establish even better learning environments.

(This story is adapted from Scott Sisco, "WKU efforts designed to improve teachers," *The Park City Daily News*, June 19, 2004, pp. 1A, 6A.)

## Knotty Problems

Dr. Claus Ernst, Professor of Mathematics in the Ogden College of Science and Engineering, is one of three principal investigators of a \$100,000 grant awarded by the National Science Foundation. The award enables Dr. Ernst to partner with a colleague at Charlotte, Dr. Yuanan Diao, and a computer science professor at WKU, Dr. Uta Ziegler, to compute the rope length of large, thick knots. The grant is split between the two campuses and WKU's share

is almost \$75,000. Both Professors Diao and Ernst are working in the field of topology. "Topo" is a (Greek) word element meaning "place" or "location" and "logy" is a (Greek) word element meaning "discourse" or "study." Thus topology is the science of studying the geometry of location of objects. One special area of topology is called knot theory, the science of knots. Knot theory is the mathematical theory of the three-dimensional configuration of flexible rings and strings. Dr. Ziegler's area of expertise is artificial intelligence and



she will handle the programming to support pure mathematical research. The emphasis of this project is to develop new methods in the area of computational geometry based on collaboration between researchers in computer science and mathematics.

The project is entitled "Computation of Rope Length of Large Thick Knots." The main question can be phrased intuitively as follows: Given a rope with a fixed length and a fixed thickness, then how many complicated knots can be tied with this rope. (An exact mathematical formulation of these concepts is complicated and beyond the scope of this article.) This research project focuses on developing algorithms and a computer program to obtain an estimate of the rope-length of large, thick knots. The algorithm under development uses a radically different new approach to determine this

estimate of the rope-length of knots. This new approach will enable the computation of estimates on the rope-length for much more complicated knots than was previously possible.

Throughout the 200-year history of knot theory there have been connections between knots and physical sciences. Physicists undertook the first systematic study of knots in the late nineteenth century motivated by a theory of matter consisting of knotted vortex atoms. Since the discovery of knotted circular DNA in the middle 1970s, the area of physical knot theory (dealing with knots that can occur in nature which are either made out of ropes or molecules) received much attention from mathematicians as well as scientists. In the laboratory biologists can use particular enzymes (topoisomerase) to generate complicated knotted circular DNA molecules of any knot type they desire. This is evidence that in nature (for in example in ourselves) there exist mechanisms to create complicated knotted molecules. An obvious question arises: What is the



Dr. Claus Ernst

reason for nature to deal with knotted molecules? What is the biological relevance of knotted DNA molecules? Theoretical results about thick knots help us to answer questions about the world of knotted molecules and are thus of interest to chemists and biologists.

## Improving on Wood

Dr. Chris Byrne, Assistant Professor, Department of Engineering, Ogden College of Science and Technology, has been awarded a grant of \$75,000 from the Kentucky Science and Technology Corporation. The grant is entitled "Development of Cellulose-Derived-Composites," and is part of the KSTC's Commercial Investment Fund, a statewide program to fund new businesses and start them on the way to commercial success.

Professor Byrne will develop a new class of materials with unique characteristics from material he has already patented and that has drawn international attention. The project will advance this young technology by focusing on development of the material production process while trying to establish the first commercial use of the technology.

He will produce carbon-polymer composites to establish market potential in the specialty wood-products arena. The exceptional beauty

of the Cellulose-Derived-Composites (CDCs) may boost them into acceptance if he can produce cost effective derivatives.

The project not only may create a new wood type for commercial use, but it educates engineering students who are involved in each step. Since the formation of a business is another primary outcome, students will also learn about establishing a business and what it takes to do so.

What consumers may see as a result of the project is a new, inexpensive, stronger, and beautiful wood





*Dr. Chris Byrne*

ceramic that has a variety of uses under high temperatures. Dr. Byrne believes that his product will have a significant market application in decorative applications. CDC ceramic materials could impact industrial processing equipment, and the aerospace, transportation and communications industries. Applications to these industries include wear resistant seals and bearings, cutting and abrasive tooling, reflectors, high temperature resistant structures and filters, and protective shields, all at lower costs than present applications.

## New Researcher

The absence of funds has not deterred WKU's Department of Biology from hiring key faculty to press on with research. The Kentucky Statewide EPSCoR Research Startup Fund program has made WKU able to hire a tenure-track researcher to involve undergraduate and graduate students in hands-on research. The funding was awarded to Steve Huskey, Assistant Professor of Biology, for nearly \$50,000. The EPSCoR program is an experimental

program to stimulate competitive research to increase research and economic development in the state.

This new tenure-seeking faculty member will extend Biology's strengths in physiology, biomechanics, and possibly developmental biology. The new scholar will complement existing research emphases in ecology, population genetics and systematics, physiology, cell biology, and biomedical sciences. Since the department has hired a scholar with many talents, Dr. Huskey will be able to interact collaboratively with researchers in other areas such as human biology and engineering. For example, Dr. Huskey will be able to establish a program in functional morphology, a field that uses anatomy, mechanical engineering, and animal behavior to measure organismal performance, which will have the potential to create partnerships with biologists in other institutions across the state, one goal of the EPSCoR program.

This position will enhance the department's ability to serve its large pool of majors. Students pursuing

pre-medical and other pre-professional degree programs will receive relevant experiential opportunities. Students enrolled in physical therapy will learn tools and techniques to measure human performance. Others may get opportunities to conduct experiments on live animals while recording their behaviors. This position will add another dimension to research and instruction, in addition to molecular and cell biology, where there are already strengths.

Dr. Huskey expects that his research will provide expertise in current areas of concern for the nation. He expects to bring technical expertise in high-speed video image analysis that can be extended to questions outside the biological sciences, such as ballistics, analysis of combustible materials, and crash testing. Biology will thus be able to fulfill its role as a bridge to other sciences. Students participating in these programs will acquire an uncommon skill set making them more marketable and able to contribute to the science and technology workforce in Kentucky.



*Dr. Steve Huskey*